## Quiz 5

Please, write clearly and justify all your statements using the material covered in class to get credit for your work.
(1) [5Pts] Prove that the sequence below is monotone and bounded. Next find its limit.

$$
s_{1}=2, \quad s_{n+1}=\frac{1}{4}\left(2 s_{n}+7\right), \quad n \geq 1 .
$$

(1) [3Pts] Prove or give a counterexample:
(a) Every monotone sequence converges.
(b) If $\left(a_{n}\right)$ and $\left(b_{n}\right)$ are monotone sequences, then $\left(c_{n}\right)=\left(a_{n}+b_{n}\right)$ is also a monotone sequence.
(c) If $\left(a_{n}\right)$ and $\left(b_{n}\right)$ are monotone non-decreasing sequences, then $\left(c_{n}\right)=\left(a_{n}+b_{n}\right)$ is also a monotone non-decreasing sequence.

